

Application No. 10/718,182

CLAIMS

1. (Original) An auxiliary power unit (APU) for a transport vehicle powered by an internal combustion engine, comprising:
  - an enclosure for housing and supporting the auxiliary power unit on the transport vehicle;
  - an air-cooled engine having an output shaft and enclosed within the enclosure with and directly driving an air-cooled, brushless generator having an armature shaft, wherein the air-cooled engine utilizes fuel supply, exhaust and electrical systems of the transport vehicle engine and the generator provides direct, simultaneous AC and DC voltage outputs without requiring an inverter or a converter circuit; and
    - first and second air duct systems within the enclosure for separately conveying cooling air into and through the air-cooled engine and the generator respectively, to exit through first and second respective air outlet ducts from the enclosure, wherein cooling inlet air is drawn into the first and second air duct systems by respective direct drive fan means integrated respectively in the air-cooled engine and in the generator.
2. (Original) The APU of claim 1, wherein the air-cooled engine directly driving the brushless generator includes a direct coupling such that the output shaft of the air-cooled engine and the generator armature shaft rotate together.
3. (Original) The APU of claim 1, wherein the air-cooled engine directly driving the brushless generator includes a direct coupling without the use of a belt, a chain, a clutch or a gear set.
4. (Original) The APU of claim 1, wherein the enclosure comprises a frame and a plurality of rigid panels secured to the frame.
5. (Original) The APU of claim 4, wherein at least a first one of the plurality of rigid panels includes at least one air inlet opening and at least a second one of the plurality of rigid panels includes at least one air outlet opening.

Application No. 10/718,182

6. (Original) The APU of claim 4, wherein at least a first one of the plurality of rigid panels includes at least a first opening into a first inlet duct to the air-cooled engine and a second one of the plurality of rigid panels includes at least a second opening into a second inlet duct to the generator.
7. (Original) The APU of claim 6, wherein a third one of the plurality of rigid panels includes at least a first air outlet opening from a first outlet duct from the air-cooled engine.
8. (Original) The APU of claim 6, wherein a third one of the plurality of rigid panels includes at least a second air outlet opening from a second outlet duct from the generator.
9. (Original) The APU of claim 5, wherein at least the first air outlet opening includes a fan for exhausting air therefrom.
10. (Original) The APU of claim 1, wherein the air-cooled engine includes a fan integrated with the output shaft for drawing air into a first air passage proximate heat radiating portions of the engine.
11. (Original) The APU of claim 10, wherein air drawn into the first air passage and heated therein exits via the first air outlet duct.
12. (Original) The APU of claim 1, wherein the air cooled brushless generator includes at least one fan integrated with the armature shaft for drawing air into a second air passage proximate heat radiating portions of the generator.
13. (Original) The APU of claim 12, wherein the air drawn into the second air passage and heated therein exits via the second air outlet duct.
14. (Original) The APU of claim 1, wherein the air-cooled engine is a diesel engine.
15. (Original) The APU of claim 1, wherein the air-cooled engine is a single cylinder engine.

16. (Original) A high efficiency auxiliary power unit, for a transport vehicle powered by an internal combustion engine and having a fuel system, an engine exhaust system and a battery powered electrical system, comprising:

an air-cooled engine configured for operation using the fuel supply and the engine exhaust system of the transport vehicle, and having an integral, forced-air cooling system;

an air-cooled, brushless generator directly coupled to an output shaft of the air-cooled engine and providing simultaneous high voltage AC and low voltage DC outputs without using an inverter or a converter and having an integral, forced-air cooling system;

an enclosure surrounding the air-cooled engine and the air-cooled brushless generator, for protection and mechanical support; and

a system of first and second air ducts within the enclosure to separately convey cooling air into and through the air-cooled engine and the brushless generator respectively, to exit through first and second respective air outlets from the enclosure, wherein cooling inlet air is drawn into the first and second air ducts by respective direct drive fan means integrated respectively in the air-cooled engine and in the brushless generator.

17. (Original) The APU of claim 16, wherein the direct coupling of the brushless generator to the output shaft of the air-cooled engine includes a direct coupling such that the output shaft of the air-cooled engine and the armature shaft of the generator rotate together.

18. (Original) The APU of claim 16, wherein the direct coupling of the brushless generator to the output shaft of the air-cooled engine includes a direct coupling without the use of a belt, a chain, a clutch or a gear set.

19. (Original) The APU of claim 16, wherein the air-cooled engine includes a fan integrated into a flywheel coupled to the output shaft of the air-cooled engine for drawing air into a first air passage proximate heat radiating portions of the air-cooled engine.

20. (Original) The APU of claim 19, wherein air drawn into the first air passage and heated therein exits via the first air outlet of the system of first and second air ducts.

Application No. 10/718,182

21. (Original) The APU of claim 16, wherein the air-cooled brushless generator includes at least one fan integrated with the armature shaft for drawing air into a second air passage proximate heat radiating portions of the generator.
22. (Original) The APU of claim 21, wherein the air drawn into the second air passage and heated therein exits via the second air outlet of the system of first and second air ducts.
23. (Original) The APU of claim 16, wherein the enclosure comprises a frame and a plurality of rigid panels secured to the frame.
24. (Original) The APU of claim 23, wherein at least a first one of the plurality of rigid panels includes at least one air inlet opening into at least one of the first and second air ducts and at least a second one of the plurality of rigid panels includes at least one air outlet opening from at least one of the first and second air ducts.
25. (Original) The APU of claim 23, wherein at least a first one of the plurality of rigid panels includes at least a first opening into a first inlet duct to the air-cooled engine and a second one of the plurality of rigid panels includes at least a second opening into a second inlet duct to the brushless generator.
26. (Original) The APU of claim 25, wherein a third one of the plurality of rigid panels includes at least a first air outlet opening from a first outlet duct from the air-cooled engine.
27. (Original) The APU of claim 25, wherein a third one of the plurality of rigid panels includes at least a second air outlet opening from a second outlet duct from the brushless generator.
28. (Original) The APU of claim 24, wherein at least the first air outlet opening includes a fan for exhausting air therefrom.
29. (Original) The APU of claim 16, wherein the air-cooled engine is a diesel engine.

Application No. 10/718,182

30. (Original) The APU of claim 16, wherein the air-cooled engine is a single cylinder engine.

31-50. (Cancelled)

51. (Original) The APU of claim 1, wherein the enclosure further comprises a lining of sound absorbing material.

52. (Original) The APU of claim 51, wherein the sound absorbing material comprises a multilayer configuration of synthetic materials having different densities.

53. (Original) The APU of claim 1, wherein the enclosure is supported on a frame member of the transport vehicle by a clamping assembly.

54. (Original) The APU of claim 53, wherein the clamping assembly comprises a clamping device for supporting the enclosure without requiring drilling or welding to complete an installation.

55. (Original) The APU of claim 54, wherein the clamping device comprises U-bolt clamps and vibration-absorbing isolation pads.

56. (Original) The APU of claim 55, wherein the clamping assembly is adjustable to adapt to different installations.

57. (Original) The APU of claim 1, wherein the enclosure is supported on a frame member of the transport vehicle by a plurality of vibration-absorbing devices.

58. (Original) The APU of claim 57, wherein a vibration-absorbing device comprises a neoprene pad of predetermined thickness and durometer.